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IS 4837 (1990): School furniture, classroom chairs and tables - Recommendations [CED 35: Furniture]



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भारतीय मानक

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मेजों के लिये सिफारिशें

(दूसरा पुनरीक्षण)

Indian Standard

**SCHOOL FURNITURE, CLASSROOM
CHAIRS AND TABLES — RECOMMENDATIONS**

(*Second Revision*)

First Reprint JULY 1996

UDC 684.43/.44 : 371.63

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**BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002**

March 1991

Price Group 2

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards on 25 April 1990, after the draft finalized by the Furniture Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was first published in 1968 and subsequently revised in 1978. This second revision of the standard has been done to incorporate certain changes found necessary in the standard in the light of comments received from the users.

This revision incorporates additional information regarding dimensions of school furniture for age group of 5-17 years children. Material and Construction Clauses have been deleted in this revision as it would be covered separately in the specification for educational furniture. Performance Tests have also been deleted as they are separately covered in IS 5416 : 1988 'Methods of tests for strength and stability of chair and stools: Part 1 Strength, and Part 2 Stability', and IS 5967 : 1988 'Methods of test for strength and stability of tables and trolleys: Part 1 Strength, and Part 2 Stability and the scope of this standard is restricted to dimensions'. Guidance on the distribution of furniture size is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SCHOOL FURNITURE, CLASSROOM CHAIRS AND TABLES — RECOMMENDATIONS

(*Second Revision*)

1 SCOPE

1.1 This standard deals with the dimensional requirements of the chairs and tables for children in the age group of 5-17 years for use in the Indian schools. The chairs and tables have been divided into four sizes related to age groups of children. These have been formulated keeping in view the following considerations:

- a) To define a minimum space under the table which shall be kept clear for the knee space.
- b) To define minimum table lengths based on width between elbows of children when writing, to ensure adequate working space.
- c) To provide data on the reach and stretch of (children) arms to assist in the design of working surfaces, any storage space, inkwell positions, etc.

2 REQUIREMENTS

2.1 There are many postures that are adopted by students in school. However, to assess the fit of the student to chair and table it is necessary for the pupil to adopt the posture shown in Fig. 1. In the design of chairs and tables seven basic requirements as follows shall be completely fulfilled simultaneously.

A Feet flat on floor

B Clearance between back of legs and front edge of seat

A Shod feet flat on floor.

B Clearance between back of legs and front edge of seat.

C No pressure at front of seat between seating surface and thighs.

D Clearance between thigh and underside of table for freedom of movement.

E Elbows approximately level with table top when upper arm vertical.

F Firm support for back in lumbar region and below shoulder blades.

G Adequate clearance between backrest and seat to ensure free movement of buttocks.

C No pressure at front of the seat between seating surface and thighs

D Clearance between thigh and underside of table for freedom of movement

E Elbows approximately level with table top when upper arm vertical

F Adequate clearance between backrest and seat to ensure free movement of buttocks

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Seat

3.1.1 Height of the Seat

The height of the seat is measured to the highest point at the front of the seating area on the centre line.

3.1.2 Effective Depth of the Seat

The depth of the seat means the dimensions measured from front to back across the chair in the middle of the seat.

3.1.3 Minimum Width of Seat

The width of the seat means the dimensions measured from side to side on a line parallel to the front of the chair, and at the middle of seat.

3.1.4 Radius of Front Edge of the Seat

This is an approximate specification of the stop surface.

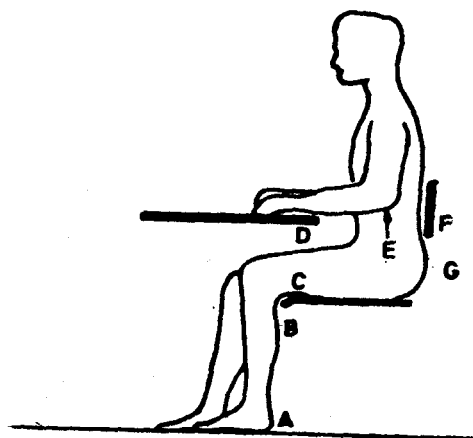


FIG. 1 FIT OF PUPIL TO CHAIR AND TABLE

3.1.5 Maximum Angle of Seat Plane

The main part of the seating surface has to lie between the horizontal and maximum slope of 4° . The seating surface may be flat or include dishing. Any dishing has not to exceed 10 mm in depth and has to occur in the back 2/3 of the effective seat depth. The deepest part of the dishing has to occur 3/4 of the effective seat

depth back from the front edge.

3.1.6 Angle Between Seat and Backrest Planes

The angle between the seat and backrest planes is measured on the centre of the seat. For chairs of sizemarks 4 (see Table 1) designed for extended periods of sitting that is in lecture and assembly halls, angle β may be increased up to a maximum of 106° (see Fig. 2).

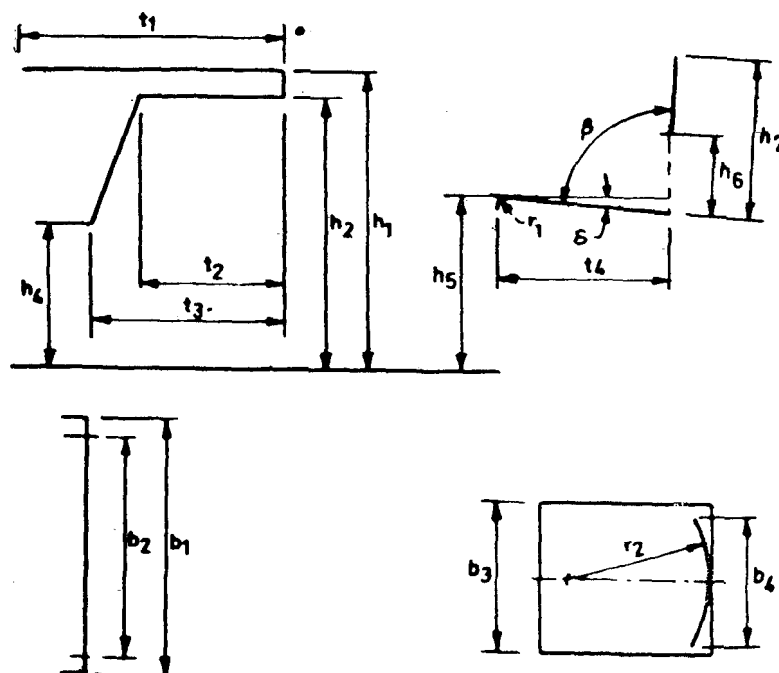


FIG. 2 DIAGRAMMATIC KEY TO DIMENSION

Table 1 Dimensions
(Clauses 3.1.6 and 4.1; and Fig. 2)

All dimensions are in millimetres unless otherwise shown.

Sizemark		1	2	3	4
Seat	h_s Height of seat	260+3	300+3	340+3	380+3
	t_s Effective depth of seat	250 to 270	280 to 300	320 to 340	350 to 370
	b_s Min width of seat	250	300	320	380
	r_1 Radius of front of seat	30 to 40	30 to 40	30 to 40	30 to 40
	δ Max angle of seat	4°	4°	4°	4°
Backrest	β Angle between seat and backrest	95° to 100°	95° to 100°	95° to 100°	95° to 100°
	h_s Seat plane to bottom of backrest	110 to 120	120 to 130	140 to 150	150 to 160
	h_1 Seat plane to top of backrest	210 to 250	250 to 280	280 to 310	310 to 330
	b_b Min width of backrest	250	250	250	280
Tables	h_1 Height of top	460+3	520+3	580+3	640+3
	t_1 Min depth of top	450	450	450	450
	b_1 Min 1 place length	450	450	450	450
	of top 2 place	1 050	1 050	1 050	1 050
Leg clearance	t_2 Min depth of knee zone	300	300	300	350
	t_3 Min depth of tibia zone	400	400	400	450
	h_k Min height of knee zone	400	460	520	580
	h_t Min height of tibia zone	250	250	300	300

3.2 Backrest

3.2.1 Seat Plane to Bottom of Backrest

This defines the foremost point of the backrest.

3.2.2 Lower and Upper Limits of Backrest

The lower and upper limits of the backrest are measured on the centre line of the seat plane from the lowest part of the seating surface. The upper and the lower edges of the backrest have to be well rounded.

3.3 Table

3.3.1 Height of Top

Table top surfaces are horizontal. When an inclined surface is required, an inclination of 16° is recommended. The edge towards the students has to be approximately at the same height as

the specified horizontal surface.

3.3.2 Minimum Depth of the Top

The short dimensions measured from front to back edges of the table top.

4 DIMENSIONS



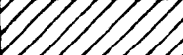

4.1 The dimensions of chairs and tables according to their respective sizemarks, shall be in accordance with Table 1. Distribution of furniture sizes according to age group is given in Fig. 3.

5 WORKING SURFACE REQUIREMENTS

5.1 Surfaces for all table tops shall have a reflection factor of not less than 20 percent and not more than 56 percent. The finished surface shall be matt and non-absorbent.

ANNEX A
(Foreword)

DISTRIBUTION OF FURNITURE SIZES

FURNITURE SIZE MARK →	1	2	3	4
AGE OF CHILDREN IN YEARS ↓	STANDING HEIGHT OF CHILDREN IN mm			
	1020-1085	1085-1245	1245-1445	1445-1620
5-6				
6-10				
10-13				
13-17				

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This Indian Standard has been developed from Doc: No. CED 35 (4698)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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